

*PISIDIUM ABDITUM* var. *LACTEUM* St.

Two live specimens and a few single valves taken in Georges River, North Warren, season of 1913.

*PISIDIUM SPHAERICUM* St.

About twenty specimens, mostly immaculate, a few nearly full grown, taken Aug., 1913, in Georges River, North Warren.

*AMNICOLA SCHROKINGERI* Frauenfeldt.

Collected by Rev. Henry W. Winkley, at Saco, York county.

*LYMNÆA DESIDIOSA* var. *PLICA* Lea.

Collected in Buckfield, Oxford County, by John A. Allen.

*PLANORBIS HIRSUTUS* Gld. (= *albus* Müll) and *P. DEFLECTUS* Say.

Were inadvertently omitted from my published list. The former has been reported from Aroostook, Knox and Penobscot counties; the latter from Aroostook, Knox, Oxford and Penobscot counties.

*VERTIGO NYLANDERI* St.

Woodland, Aroostook Co. (Nylander). See *NAUTILUS*, Vol. XXII, p. 107.

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**STUDIES IN NAJADES.**


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BY DR. A. E. ORTMANN.

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(Continued from Vol. XXVII, p. 91.)

*FUSCONAJA ASKEWI* (Marsh). (See: *Quadrula a.* Simpson, 1900, p. 786.)

A number of specimens, among them males, sterile and gravid females, from Sabine River, Logansport, De Soto Par., Louisiana, were received from D. S. Frierson, mostly collected on August 1, 1912, but one gravid female was collected on September 21.

In all females (altogether eleven) all four gills had marsupial structure, and in five gravid ones all four gills were charged. But in one gravid individual only the outer gills contained glochidia; but the inner gills had distinctly marsupial structure. Since there were placenta and fragments of them in the suprabranchial canals and the cloaca cavity, this specimen was caught in the act of discharging.

The breeding season probably ends in August, but the gravid specimen, with glochidia, collected on September 21, is remarkable. It

seems that in lower latitudes the breeding time does not depend strictly on the season. For instance, I have a gravid female, with eggs, of *Fusconaja undata* (Barnes) from the Ouachita River, Arkadelphia, Clark Co., Arkansas, collected by H. E. Wheeler on September 3, 1912, while another one, recorded previously (Ortmann, 1912, p. 241) was obtained in the same condition March 21, 1911.

*F. askewi* has a short mantle connection between anal and supranal, which was absent (torn?) in a few cases. Anal with very fine papillæ, branchial with distinct papillæ. Inner lamina of inner gills free from abdominal sac, except at anterior end. Posterior margins of palpi connected for about one-half of their length or a little less.

In the female, all four gills are marsupial. Placentæ well developed, subcylindrical, and, according to a communication from Frierson, red "in most cases." Glochidia without hooks, semielliptical, higher than long. Length, 0.13, height, 0.15 mm.

Color of soft parts partly destroyed in alcohol, but there are indications that mantle edge, adductors, and foot, had a more or less pronounced tendency to be orange-brown. Frierson informs me, that in life the soft parts may be orange or whitish.

This species clearly belongs in the *undata-trigona-rubiginosa* group, and is not at all related to the species with which it has been placed by Simpson (1900, p. 786), at any rate, it is not related to *Elliptio beadleianus* (Lea) (see Ortmann, l. c. p. 268), although it resembles this species somewhat in the shell; but this is clearly a case of convergency.

CRENODONTA PERPLICATA (Conrad) (See Ortmann, 1912, p. 248).

A gravid female, with glochidia, was received from H. E. Wheeler, from the "Old River" of the Ouachita River, Arkadelphia, Clark Co., Arkansas, collected June 26, 1911. Another discharging female, is at hand from Sabine River, Logansport, De Sota Par., Louisiana, collected by L. S. Frierson, August 1, 1912.

Also in this species the breeding season seems to be subject to considerable variation: ripe glochidia are present as early as June 26, and as late as August 6.

The glochidia of the present specimens are absolutely like those observed previously. Length, 0.20; height, 0.21 mm.

QUADRULA PUSTULATA (Lea) (See Simpson, 1900, p. 781).

Wabash River, New Harmony, Posey Co., Indiana, collected

Aug. 8, 1912, by A. A. Hinkley. Aside from several very young ones, the sex of which could not be ascertained, there were two large males, and a gravid female, discharging glochidia. The date (Aug. 8) indicates the end of the breeding season.

Anal opening separated from the supraanal by a short mantle-connection, but in the largest male the two openings are united, the mantle-connection being undoubtedly torn. Anal with the inner edge almost smooth, branchial with distinct papillae. Posterior margins of palpi connected for about one-half of their length.

Inner lamina of inner gills free from the abdominal sac, except at anterior end. In the female, all four gills are marsupial. The shape of the placentae could not be observed, since the female was discharging, and the glochidia filled the suprabranchial canals and cloacal cavity in large, loose masses. But many glochidia were yet lodged in all four gills.

Glochidia subovate, higher than long, of medium size. Length, 0.20; height, 0.24 mm.

Color of soft parts apparently of the whitish type.

This is a true *Quadrula*, allied in its shell characters to *Q. lachrymosa* (Lea). From *Q. pustulosa* (Lea) it is rather sharply distinguished by the glochidia, which are considerably larger in the latter species,  $0.23 \times 0.30$  according to Lefevre and Curtis (Journ. Exp. Zool., 1910, p. 98, fig. 1, F), while I found them (in specimens from West Virginia) to be  $0.22 \times 0.29$  mm.

(To be continued.)

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#### NOTES.

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ANOTHER GIANT SQUID IN MONTEREY BAY.—Since the publication of my note in the NAUTILUS of February, 1912, I have been informed of the occurrence of another big squid in the same region as the one previously reported. Hoping to secure further details, I laid the note to one side, but as no further data have been forthcoming, it may be well to publish the record that it may not be lost. Such information as I have been able to obtain was furnished to Dr. Harold Heath of Stanford University by Mr. K. Hovden, Manager of the Booth Canning Company at Monterey, who happened to be fortunate enough to see the specimen.

About October 12, 1912, some Italian fishermen in Monterey Bay